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**SECTION 3**

**OPTIONS**

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# MARKETING AND RISK MANAGEMENT

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# MARKETING AND RISK MANAGEMENT

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## AGRICULTURAL OPTIONS: A MARKETING FOR MANAGING PRICE RISK

### WHAT IS AN OPTION?

An **option** contract is simply an agreement which allows the purchaser the opportunity, but not the obligation, to buy or sell a futures contract at a specified price. Since buyers of options have the “option” but not the “obligation” to exercise their right to buy or sell futures contracts at a specified price, they are called “options.”

An option is like an insurance policy. Just as a producer may purchase the right from an insurance agency to collect on a policy in case of a disaster, he or she may purchase the right to buy or sell a commodity (through a futures contract) at a specific price in case of a disastrous price move. As in the case of an insurance policy against fire, the producer must pay a **premium** to insure against commodity price declines or increases. A producer could collect on the option if the price moves in an unfavorable direction.

There are two types of options. They are the “PUT” option and the “CALL” option. The **put** option is purchased by the producer who wants to insure against price declines. The put option insures a minimum selling price for the option buyer who has a commodity to sell. It is called a “put” because the producer has a commodity to “put on the market.” The **put** option gives the option buyer the right to **sell** a particular futures contract at a specified price. How this works will be explained a little later.

The **call** option is purchased by the producer who wants to insure against price increases. The call option insures a maximum purchase price for the option buyer who wants to purchase a commodity. It is termed a “call” because the producer wants to “call a commodity off the market.” This would normally be used by a producer who is purchasing a commodity to use in the production of some other product. For example, a cattle feeder might be interested in buying a call option for corn to insure against a large price increase in corn. The **call** option gives the option buyer the right to **buy** a particular futures contract at a specified price. How this works will be explained a little later.

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## BASIC UNDERSTANDING OF THE FUTURES MARKET AND HEDGING

As you'll notice in the discussion introducing options, you are guaranteed the right to buy or sell a futures contract when you purchase an option. Since options are tied to the futures market a basic understanding of the futures market and how it works is necessary to use the options market.

### WHAT IS A FUTURES CONTRACT?

A futures contract is a standardized agreement to buy or sell a commodity at a date in the future. It specifies:

- **.Commodity** to be delivered (corn, soybeans, wheat, live cattle -- i.e. fed cattle, hogs, feeder cattle<sup>1</sup>, etc.).
- **.Quantity** of the commodity (number of bushels of grain or pounds of livestock as well as range of weight for individual animals).
- **.Quality** of the commodity (specification based on U.S. grades).
- **.Delivery point** (location at which to deliver commodity).
- **.Delivery date** (within month that contract terminates).

The only aspect of a futures contract that is not specified is the **price** at which the commodity is to be bought or sold. The price varies. It is determined on the floor of the commodity exchange as traders buy and sell the contracts. The prices they offer and bid in the open outcry setting reflect their expectations of supply and demand conditions and price for the commodity at contract maturity.

As the delivery month on a contract approaches, the futures and cash prices converge. The convergence of the futures and cash prices is brought about because of the threat of delivery. If, for example, the futures price was way above cash price during the delivery month, hedgers might deliver their commodity rather than buy or sell like contracts to offset their position, or speculators might buy cattle in the cash market and merchandise them through the futures market. This means market actors

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<sup>1</sup> Note: Feeder cattle contracts can no longer be delivered upon. They are now cash settlement contracts. All positions remaining open at contract maturity are settled in cash based on the Chicago Mercantile Index.

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could capture the higher futures price for their commodity. These market actors would continue to deliver on their futures contracts until the futures price did not offer an incentive to do so. This price convergence brought on by the threat of delivery is what makes the futures market a viable marketing alternative for producers who actually deal in the cash market for commodities.

This chart shows contract quantities for some of the agricultural commodities and gives examples of each futures contract's value at a particular price. Remember that price will vary in the futures market, but in the options market you purchase the right (by paying a premium) to buy or sell a futures contract at a specified price.

Commodity	Exchange	Quantity	Price	Contract Value
CORN	CBT	5,000 BU.	\$2.25/BU.	\$11,250
SOYBEANS	CBT	5,000 BU.	\$5.60/BU.	\$28,000
WHEAT	CBT	5,000 BU.	\$3.60/BU.	\$18,000
LIVE HOGS	CME	40,000 LB.	\$44.10/CWT.	\$17,640
LIVE CATTLE	CME	40,000 LB.	\$71.00/CWT.	\$28,400
FDR CATTLE <sup>2</sup>	CME	50,000 LB.	\$84.51/CWT.	\$42,255

## FUTURES MARKET TRADERS

There are two basic market actors or traders who use the futures market. They are hedgers and speculators. Both actors are necessary for the market to work properly and discover prices efficiently.

**Hedgers** expect to sell or purchase a commodity in the cash market at some future point in time, but they do not want to take on the risk of variable prices in the cash markets. Given their desire to reduce risk, hedgers use the futures market to lock in a price. They transfer their risk to speculators. Most hedgers remove their obligation to deliver or take delivery on the futures contract by offsetting their position, but hedgers then sell or buy actual commodities in the cash markets. For

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<sup>2</sup> Feeder cattle contracts changed to 50,000 lb. contracts with the January 1993 contract. The cash settlement price is no longer based on the U.S. Feeder Steer Price. It is based on the CME Index for a 12 state region for 700 to 800 pound feeder steers.

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example, let's say a producer expects to sell 20,000 bushels of wheat in December (5 months from now). He would sell or "go short" four contracts of December wheat. Once you take a short position, you are contractually obligated to **deliver** the specified quantity and quality of the commodity for the futures market determined price. Normally the hedger would then buy or "go long" four December wheat contracts in December. The hedger now has sold (went short) and bought (went long) four December wheat contracts in the futures market and has no outstanding position. This is called offsetting the position in the futures market. The hedger would then take any gains or losses out of the futures market and add or subtract those from the price received when the wheat is marketed in the cash market.

**Speculators** have no intention of buying or selling actual commodities in the cash market. They try to make money by buying futures contracts at a low price and selling back at a higher price or by selling at a high price and buying back at a low price. They take on the risk that prices may change to their disadvantage. In this way, speculators accept the risk for hedgers. For example, if a hedger "goes short" in the market, someone, usually a speculator, "goes long" at the same time for the market determined price. The speculator is betting that the futures price will rise above its current level, and the speculator hopes to "go short" for a higher price at a later date when offsetting the long position. Thus, it can be seen that the speculator plays an important role for the hedger. Without the speculator who is willing to chance unfavorable price moves, the hedger would not be able to use the futures market to reduce price risk because there would not be enough people willing to "go long" when the hedger needed to "go short" or vice versa.

Prices discovered in the futures market result from actions taken by speculators and hedgers. A hedger uses the futures market to guarantee a future price for a commodity he/she wishes to buy or sell in the cash market. The speculator assumes the price risk for the hedger by taking the opposite position of the hedger while hoping to make a profit from a favorable price move. When performing this function, the speculator interprets market information and helps determine market price. The speculator also helps provide market liquidity (i.e., a market with sufficient trade volume where one can buy or sell contracts at little or no concession to price). Thus, the hedger and the speculator both help determine the futures price. If the market price is not in line with current information, actors will continue to trade until a rational futures price is determined.

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## BASIS: AN IMPORTANT PART OF HEDGING

As you recall from our discussion on how price is discovered in the futures market, we mentioned that cash and futures prices converge as the contract matures. However, just as cattle sold in Torrington and Dallas on the same day may have different prices, the futures market price and the cash market price in your area for the same commodity will probably be different when the futures contract expires. This relationship between futures price and cash price at the end of a hedge is very important. It is called **basis**.

**Basis** is the relationship of the local cash market price and futures market price for the commodity being hedged. The value of basis is calculated by subtracting the futures price when you offset your initial position from the local cash price. For example, if the cash price for corn is \$2.00 and the futures price is \$2.20, then basis is  $\$2.00 - \$2.20 = -\$0.20$ , or basis is said to be *20 cents under futures*. With a cash price of \$2.55 and futures price of \$2.54, the basis is  $\$2.55 - \$2.54 = \$0.01$ , or 1 cent over.

$$\text{BASIS} = \text{CASH PRICE} - \text{FUTURES PRICE}$$

These are the main principles behind the concept of basis that are important to know:

- BASIS= CASH PRICE - FUTURES PRICE  
If the cash price for feeder cattle is \$81.50/cwt. and the futures price is \$79.40/cwt. then basis is \$2.10, or *\$2.10 over*. If the cash price for corn is \$2.50/bu. and the futures price is \$2.65, then the basis is  $-\$0.15$ , or *15 cents under*.
- A negative basis is said to be under; a positive basis is said to be over.
- Factors affecting the basis include:
  - Local supply and demand
  - Transportation costs from local area to a par delivery point
  - Carrying charges for grains such as storage
  - Marketing charges for livestock such as shrinkage
  - Quality factors: Differences in quality of your product versus contract specifications.
- Basis varies from one location to another.

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- Basis in a particular location changes during the life of a futures contract, starting wide and tending to narrow as the delivery date of the futures contract approaches. This is expected since cash and futures prices should converge due to the threat of delivery.
- **Strengthening** or **narrowing** of basis is a term used to describe the relative relationship between cash and futures prices. When the cash price increases over time relative to futures price basis is said to be strengthening or narrowing (i.e. cash price getting stronger relative to futures price).
- A **weakening** or **widening** of the basis occurs when the cash price decreases relative to futures price over time.

Example: Illustrating Narrowing of the Basis \_\_\_\_\_ Date Cash

<u>Price</u>	<u>July Corn Futures</u>	<u>Basis</u>	
Jun 1	\$2.00/bu	\$2.25/bu	-\$0.25(under)
Jun 15	\$2.50/bu	\$2.60/bu	-\$0.10(under)
Jul 1	\$2.30/bu	\$2.25/bu	\$0.05(over)

-June 1 to June 15 basis strengthened or narrowed  
-June 15 to Jul 1 price levels dropped but the basis still strengthened or narrowed. On both instances cash price strengthened relative to the futures price.

Example: Illustrating Widening of the Basis \_\_\_\_\_

<u>Date</u>	<u>Cash Price</u>	<u>July Wheat Futures</u>	<u>Basis</u>
Jun 1	\$3.10/bu	\$3.00/bu	\$0.10(over)
Jun 15	\$3.20/bu	\$3.40/bu	-\$0.20(under)
Jul 1	\$3.50/bu	\$3.80/bu	-\$0.30(under)

The concept of weakening or strengthening has important implications for both long hedgers and short hedgers using the futures market or the options market. If basis weakens the long hedger is better off because he/she realizes a basis gain, but the short hedger is worse off because he/she realizes a basis loss. The reverse is true if basis strengthens. If basis strengthens the short hedger realizes a basis gain, and the long hedger realizes a basis loss. Remember the options contract guarantees the right to exercise into the futures market at the specified price (called a strike price). Given this relationship between the futures and the options markets, basis is important for a person using either the futures or options



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market to reduce price risk. These concepts will be illustrated later when we go through the mechanics of both types of hedges when using the options market.

## THE MECHANICS OF A SHORT HEDGE USING THE FUTURES MARKET

When a producer plans to sell a commodity, he/she can use a short hedge to lock in a price and protect against price decreases. It is important to remember that if you plan to sell the commodity in the future, you need to sell in the futures market when you take your initial position. Otherwise you will not be locking in a future sale price for your commodity.

The producer or holder of the a product must decide, at any point in time, whether the forward pricing opportunity being offered is acceptable. An acceptable price may mean deciding whether the current price offers an acceptable level of profit or an acceptable level of reduced losses. This decision on whether the price is acceptable is dependent on the producer's marketing plan and/or objectives (the subject of market plans will be discussed later). The expected **target** price can be calculated as follows:

$$\text{EXPECTED TARGET PRICE} = \text{FUTURES PRICE} + \text{BASIS}$$

If the hedger has decided the expected target price is acceptable. The following steps are involved.

- Sell (or go short) necessary number of contracts.
- Then offset position (go long).
- And sell commodity in cash market.

Selling or going short a commodity futures contract is hedging or forward pricing the underlying commodity, and the hedger is protected against the risk of falling cash prices after going short. Selling the futures contract is essentially a temporary substitute for selling the commodity at a later date in the cash market. For example, if you have a commodity to sell at a later date, you can sell a futures contract now. If prices fall, you sell your actual commodity at a lower cash price, but realize a gain in the futures market by buying back the futures contract at a lower price than you sold it for. If prices rise, your higher price in the cash market covers the loss when you buy back a futures contract at a higher price.

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Now let's go through some examples to illustrate how this works.

**Example 1.** Suppose you plan to have 65 steers coming off grass weighing an average of 800 pounds when you sell them in October. It's now April, and you are uncertain about the outlook for cattle prices. The October futures price is \$82.00/cwt, and you expect the basis to be \$2.00 under. This means your expected target price for these cattle would be \$80.00/cwt (\$82.00 - \$2.00). Let's say your fears of falling prices are confirmed. By October, the futures price has fallen to \$76.00/cwt when you lift the hedge, and you sell the steers at the local auction for \$74.50/cwt. You buy back the futures contract and realize a gain of \$6.00/cwt (\$82.00-\$76.00). The net price you receive is the cash price of \$74.50 plus the \$6.00 futures gain, or \$80.50.

EXPECTED TARGET PRICE = FUTURES PRICE + EXPECTED BASIS  
                                   \$80.00                                  \$82.00                                  -\$2.00

### TRANSACTIONS IN CASH AND FUTURES MARKET

DATE	CASH MARKET	FUTURES MARKET
APRIL	Expect to sell 65 hd. in October	Short 1 Oct. Feeder contract @ \$82.00
OCTOBER	Sell 65 head at Auction @ \$74.50	Long 1 Oct. Feeder contract @ \$76.00

NET PRICE FOR CATTLE = CASH PRICE + FUTURES GAIN  
                                   \$80.50                                  \$74.50                                  \$6.00

ACTUAL BASIS = CASH PRICE - FUTURES PRICE  
                                   -\$1.50                                  \$75.50                                  \$76.00

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Notice that the lower price in the cash market is offset by the gain you realized in the futures market. Also notice that the net price received is a little higher than we expected because the basis strengthened or narrowed from our expectations.

**Example 2.** What happens if the market rises rather than falls? Assume the same scenario, but suppose cash price in October turns out to be \$85.00/cwt, and the October futures price turns out to be \$87.50/cwt when you lift the hedge and offset your position.

$$\begin{array}{rcl} \text{EXPECTED TARGET PRICE} & = & \text{FUTURES PRICE} + \text{EXPECTED BASIS} \\ \$80.00 & & \$82.00 \quad \quad \quad -\$2.00 \end{array}$$

### TRANSACTIONS IN CASH AND FUTURES MARKET

DATE	CASH MARKET	FUTURES MARKET
APRIL	Expect to sell 65 hd. in October	Short 1 Oct. Feeder contract @ \$82.00
OCTOBER	Sell 65 head at Auction @ \$85.00	Long 1 Oct. Feeder contract @ \$87.50

$$\begin{array}{rcl} \text{NET PRICE FOR CATTLE} & = & \text{CASH PRICE} + \text{FUTURES GAIN} \\ \$79.50 & & \$85.00 \quad \quad \quad -\$5.50 \end{array}$$

$$\begin{array}{rcl} \text{ACTUAL BASIS} & = & \text{CASH PRICE} - \text{FUTURES PRICE} \\ -\$2.50 & & \$85.00 \quad \quad \quad \$87.50 \end{array}$$

Notice in this example, the loss you experience in the futures market is offset by the higher price in the cash market. The net price you receive is less than the previous example because the actual basis weakened or widened from the expected basis.

## THE MECHANICS OF A LONG HEDGE USING THE FUTURES MARKET

When a producer or processor plans to buy a commodity, he/she can use a long hedge to lock in a price and protect against price increases. It is important to remember that if you plan to buy a commodity in the future, you need to buy in the futures market when you take your initial position.

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As before, the producer or processor who wishes to purchase a commodity must decide, at any point in time, whether the forward pricing opportunity being offered is acceptable. An acceptable price may mean deciding whether the current price offers an acceptable level of profit or an acceptable level of reduced losses. The expected **target** price to be paid for the commodity is calculated in the same manner as the short hedge.

## EXPECTED TARGET PRICE = FUTURES PRICE + BASIS

If the long hedger has decided the expected target price is acceptable. The following steps are involved.

- Buy (or go long) necessary number of contracts.
- Then offset position (go short).
- And buy commodity in cash market.

As was the case in the short hedge, the price paid for the commodity is locked in after the long position is taken. However, the difference with the long hedge is that a gain in the futures market results in a lower overall purchase price for the commodity. In essence, any gains in the futures market subsidize the purchase of the commodity in the cash market. Any losses in the futures market translate into a higher purchase price because total out of pocket costs to buy the commodity are increased.

If prices fall, you buy your actual commodity at a lower cash price, but realize a loss in the futures market by selling back the futures contract at a lower price than you paid. If prices rise, your higher price in the cash market is reduced by the gain when you sell back the futures contract at a higher price.

Now let's go through an example to illustrate how this works.

**Example 1.** Suppose you plan to feed steers next fall after they come off grass. It's now October, and you are uncertain about the outlook for corn prices in July. Next July is when you plan to buy the 10,000 bushels for your fall feeding program. You are able to place the hedge for \$2.50/bu, and you expect the basis to be \$.08 under. This means your expected target price for the corn would be \$2.42 (\$2.50 - \$.08). Let's say your fears of rising prices are confirmed. By July, the futures price has risen to \$2.60/bu when you lift the hedge, and you buy the corn at the local elevator for \$2.54. You sell back the futures contract and realize a gain of \$.10 (\$2.60-\$2.50). The net price you pay is the cash price of \$2.54 minus the \$.10 futures gain, or \$2.44.

EXPECTED TARGET PRICE = FUTURES PRICE + EXPECTED BASIS

\$2.42	\$2.50	-.08
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## TRANSACTIONS IN CASH AND FUTURES MARKET

DATE	CASH MARKET	FUTURES MARKET
OCTOBER	Expect to buy corn in July.	Long 2 Jul. corn contracts @ \$2.50
JULY	Buy 10,000 bushels at local elevator for \$2.54	Short 2 Jul. corn contract @ \$2.60

NET PRICE FOR CATTLE = CASH PRICE - FUTURES GAIN

\$2.44                                  \$2.54                                  \$.10

ACTUAL BASIS = CASH PRICE - FUTURES PRICE

-\$ .06                                  \$2.54                                  \$2.60

Notice that the higher price in the cash market is offset by the gain you realized in the futures market. Additionally, the net price paid is higher than we expected because the basis narrowed.

In these examples behavior in the basis which was not expected meant that a different price was realized. However, in the case of the short hedger when basis narrowed a gain was realized. The reverse was true for the long hedger. Different behavior in the basis can also translate into prices different than expectations when using the options market. Thus, basis is an important concept when using either the futures market or the options market to manage price risk.

## SOME GUIDELINES ESTIMATING BASIS

It is very important to have a good estimate of basis in order to have a successful hedging program. It is worth the effort required to gather historical information on basis, record it, and keep it updated for the five most recent years. This process is not as difficult as one might think. You could, for example, keep a record of local cash prices for the months you normally sell your commodity and compare that to the futures price of the appropriate futures contract. When it is necessary to go back and create a historical data set, some time savers are possible. Take a cash quote in the middle of the week for your local market, Wednesday for example, and record it. Match that cash quote against the close of the futures contract for the appropriate futures contract for the same Wednesday.

Be sure the cash quote you use is appropriate for the type of commodity you sell. For example, if you sell steers in the fall that average 700 pounds, use prices

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quoted for steers in that weight class. Also, if you sell exotic breeds try to get market quotes that reflect that type of cattle.

Additionally, be sure the futures contract you use closely matches up with your marketing plan. Each contract represents a specific month in which the contract expires. A basis calculated using the July wheat contract price is not the same as a basis calculated using a December wheat contract price because of the different expiration dates. Use a contract that expires in the same month you normally enter the cash market for your commodity. If a contract doesn't exist for that month, use the contract month that most closely follows your cash market activities. For example, if you normally sell your commodity in November, and there is not a November contract, use the December contract. Don't use a contract which expires prior to your usual cash sale date.

In addition to using the correct contract month, you should also use the contract which most closely represents the commodity you're interested in. For example, the basis calculated using the Kansas City Board of Trade July wheat contract price is not the same as the basis calculated using the Chicago Board of Trade wheat contract price. The Kansas City Board of Trade wheat contract represents a hard red winter wheat, while the Chicago Board of Trade wheat contract represents soft red winter wheat.

## WHY USE OPTIONS?

Based on our previous discussion we've introduced the concept of what an option is. It's an insurance policy against unfavorable price moves. In the case of the **put** option, the buyer of the option is guaranteed the right to go short in the futures market at the specified price. In the case of the **call** option, the buyer of the option is guaranteed the right to go long in the futures market at the specified price. We've also reviewed the concept of hedging using the futures market. As we've demonstrated the use of futures for hedging can reduce our price risk. Then why should we consider using options as a price risk management tool?

The options offer two advantages over hedging in the futures market. First from our discussion it is apparent the futures market locks in a price subject to basis risk. Producers who hedge with a short position in the futures market often fear that cash price will rise, and those gains associated with that rise will not be available if a price is locked in by hedging with futures. Even if the price established earlier offers a profit, there is a tendency for producers to view the hedge set early at relatively low prices to be a bad decision. In this case, if prices rise, remember that gains in the cash

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market associated with that rise are negated by losses in the futures transaction. Even though price is locked in and risk is reduced, producers tend to focus on the futures market loss and talk about how the futures market lost them money. The opposite is true for the long hedger, if prices drop the buyer of the commodity locks in price, but the commodity could have been purchased at a lower price if the hedge had not been used. Thus, the futures market reduces risk against unfavorable price moves, but it does not allow the hedger to capture benefits from favorable price moves. Unlike futures hedging, buying options does not lock in a price. It allows you the right, but not the obligation, to be in the futures market. So, one advantage of options is that the producer can benefit from the right to exercise into the futures market if prices become unfavorable, but still have the opportunity to not be locked in if price moves favorably.

The second advantage of the options market is that it doesn't require the buyer of the option to maintain and manage a margin account. Up to this point we haven't discussed margin accounts associated with the futures market.

Briefly let's explain what a margin account is. When you sell or buy futures contracts, you are required to place a deposit of money with your broker to insure that the broker will not have to pay for any losses you might incur in the futures market. The deposit is a small percentage of the value of each contract traded, representing the loss you could incur in the next day's market. This initial deposit level is called the **initial margin**. While you hold a position in the market, the broker calculates the value of your futures market position each day. When the value of your position falls below a certain level (called the **maintenance margin**), the broker will make a **margin call**. The broker will require you to deposit enough money in your margin account to bring it back up to the initial margin level.

For a short hedging account, the value of the hedging account will increase if the futures market price of the contract sold initially decreases. Consequently if the futures market price rises above the initial position price the value of the hedging account will decrease. The reverse is true for a long hedger's account.

This hedging account often requires a good relationship between a producer and a lender, and it often requires a special line of credit which can be used by the producer on demand to make sometimes daily margin deposits with the broker. There are countless examples of producers being forced to offset short hedge positions due to the inability or lack of willingness to provide the needed margin funds when the futures market is moving against the initial position. Don't forget, however, if the futures market is rising, the cash market is likely rising as well. Often, the market turns lower after the upward price surge that forces the producer to offset the hedge. Once the hedge is offset the producer has not only incurred a loss in the hedge

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account, but is without price protection and faces the risk of loss in the cash market as well. Since the option buyer has the right, but not the obligation, to be in the futures market a margin account is not required by the broker until that right is exercised into a futures market position. As we discuss options in more detail, we will see how hedgers may not ever need a margin account when using options.

Thus, options can eliminate the need for a margin account and they leave open the opportunity to capture favorable price moves. These two advantages over the futures market offer important possibilities in a marketing and price risk management program.

## OPTIONS TERMINOLOGY

In order to better understand options and how to use them, we must first learn the terminology used in the options market. Here are some of the major terms - including some that have already been discussed - and a brief description of what they mean.

- Futures option- An **option** on a futures contract is an agreement that grants you the right, but not the obligation, to **buy** or **sell** the futures contract at a specific price.
- Buyer- The purchaser of an option, also referred to as the **option holder**. The buyer of an option - and only the buyer- has the right to exercise the option into a futures position.
- Seller- One who sells an option, also referred to as the **writer** or grantor of the option. The seller receives the money the option holder pays (premium), and is obligated to take an opposite futures position if and when the option is exercised.
- Underlying contract- The specific futures contract which the option holder has the right to **purchase** (in the case of a **call option**) or **sell** (in the case of a **put option**).
- Put option- An option which gives the option holder the right to **sell** (**go short**) the specified futures contract at a specific price. If the buyer exercises the put option, a short futures position will be acquired and someone who has sold a put option with the same contract month, commodity and strike price will be assigned a long futures position at the same time.



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- Call option- An option which gives the option buyer the right to **purchase (go long)** a particular futures contract at a specific price. If the buyer exercises the call option, a long futures position will be acquired, and the same time, short futures position will be assigned to someone who has sold a call option for a like commodity, contract month and strike price.
- Strike Price- The price per unit (i.e. bushel or cwt) of the underlying futures contract named in the option at which you can take a position in the futures market, if you exercise your right to buy or sell the underlying contract. The exchanges set strike prices in constant increments. For the livestock futures, the increment is \$2.00/cwt. For small grains it is \$.10/bu., and for soybeans it is \$.25/bu. If the December hog futures, for example, are trading around \$50, the CME will list options from \$44 in \$2.00 increments up through \$56. Options for March soybean futures that are trading around \$6.00 would be offered in \$.25 per bushel intervals above and below the \$6.00 trading price level.
- Exercise- The action taken by the buyer (holder) of an option who wishes to acquire a position in the underlying futures contract at the option strike price.
- Premium- The “price” of the option. It is like the premium you pay for an insurance policy. In order for you to be guaranteed the right to exercise into the futures market at the strike price for the underlying contract, you must pay a price. That price is paid by the option buyer and this is the premium received by the option writer if the option is never exercised. The premium represents the maximum amount the option buyer can lose. The **premium** is the only term of the option contract negotiated in the trading pit; all other contract terms are standardized and predetermined.
- Expiration Date- The last day on which an option can be exercised. Options expire on a specified date usually during the month preceding the futures contract delivery month.

## HOW DOES THE OPTIONS MARKET WORK?

We've discussed what an option is, but how does the options market work? If I buy a put, what happens? These are common questions asked. An understanding of who acts in this market, and how it works is important.

Call options and put options are completely separate. Some people confuse this concept because in the futures market if you have a short you have to offset with a

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long and vice versa, or else you have to deliver the commodity or accept delivery of the commodity to meet your contractual obligations. In the case of the options market puts and calls are separate from one another. You can buy and sell puts, and you can buy and sell calls. **Calls and puts are not opposite sides of the same transaction.**

Options are traded on organized and regulated exchanges just the same as futures contracts. Options are traded on the same exchange trading floor where the underlying futures contracts are traded. For example, feeder cattle contracts are traded in a pit for feeder cattle on the Chicago Mercantile Exchange. Options on feeder cattle contracts are also traded at the Chicago Mercantile Exchange in the feeder cattle pit. Both calls and puts for feeder cattle can be traded in the pit.

As mentioned above in one of the definitions, option contracts are standardized agreements based on the underlying futures contract. Each option contract represents the same commodity and delivery month in the futures contract. The option strike price is set by the exchange and is in equal increments above and below the current underlying futures price level. The only thing that is negotiable is the “price” or **premium** paid for the option contract. Thus, if someone places an order for a put or call, the commodity, futures delivery month for that commodity and strike price is specified, and it can be to either buy or sell said put or call option. Once the broker receives an order to purchase a put, for example, a floor trader receives that order from the broker. In the pit the floor trader cries out that he/she wants to buy a specific put (i.e. contract month, commodity and strike price). At that time another floor trader must offer to sell a put meeting those specifications. The traders then offer competitive bids and haggle until a premium is determined. Thus, after that is complete a buyer of the put and a seller of the put each have a position in the options market. The same procedure takes place for calls.

Remember that in the case of the futures market, hedgers are required to have margin accounts to assure that adequate funds are available on a day-to-day basis to cover losses that might be incurred in their futures position. We said that one of the advantages for option buyers was that margin accounts could be avoided.

Since the most that an option buyer can possibly lose is the option premium (unless the option position is exercised into a futures position), this is the most that will have to be deposited with the broker (the money then is paid to an account for the seller). Option sellers, on the other hand, face the same risks as participants in the futures market. For example, if you have sold a call (and will therefore be assigned a short futures position if the option is exercised), your risk is the same as someone who already has a long futures position. The only difference is that, as the seller of an option, you have received the option premium. Nonetheless, sellers of options must

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deposit and maintain adequate funds in a margin account to cover potential losses on a day-to-day basis.

## MORE ABOUT THE PREMIUMS ON OPTIONS

As mentioned before, the **premium** is what the buyer of an option pays to be able to exercise into the futures market at the strike price. These premiums represent the cost of the protection and flexibility that the options offer. remember option premiums for each designated strike price for a particular commodity futures contract are discovered in a competitive auction at the exchanges much like futures prices are discovered. The premium also becomes an important factor in determining what price the hedger is able to guarantee by using the options market.

Let's spend a little time discussing these premiums and what affects them before discussing hedging strategies in the options market. First let's look at some premiums for a commodity for both puts and calls.

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FEEDER CATTLE (CME) 50,000 LB. - \$/CWT.

Strike Price	Calls May	Calls Aug	Puts May	Puts Aug
\$80	4.27	4.17	0.17	0.85
\$82	2.50	2.70	0.40	1.32
\$84	1.15	1.50	1.05	2.15
\$86	0.35	0.75	2.25	3.35
\$88	0.07	0.30	----	----
\$90	0.02	----	----	----

Notice that the premiums (taken from Wall Street Journal Quotes for 4/8/93) are much different depending on whether they are puts or calls for the same strike price. Also notice as strike price changes for the same call or put the premium changes as well. Premiums tend to vary depending on several things.

Premiums vary depending on:

- The relationship of the strike price to the current futures price for the same underlying contract.
- The level of price volatility in the underlying futures contract.
- The time left before the option expires.

The relationship of the strike price to the current futures price is called the **intrinsic value** of the option. This basically refers to whether or not the option could be exercised into the futures market and take a profit out of the futures market given the current futures price. For example, if you purchased a put for feeder cattle with an \$84 strike price and the current futures price is \$80 that option has intrinsic value. If you exercised into the futures market you are guaranteed a short position at \$84 and you could turn around and offset that short position with a long and make \$4 per hundredweight. Thus, the intrinsic value of that \$84 put is \$4/cwt given the current futures price of \$80/cwt. The intrinsic value of a **put** is the **strike price minus the futures price**. If the futures price is below the strike price the option will have intrinsic value. If the futures price is equal to or above the strike price, then the option is said to have zero intrinsic value. The **intrinsic value can never be negative**.

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PUT	STRIKE PRICE	\$84.00	\$84.00	\$84.00	\$84.00
	<u>-FUTURES PRICE</u>	<u>\$80.00</u>	<u>\$83.50</u>	<u>\$84.00</u>	<u>\$85.00</u>
	INTRINSIC VALUE	\$ 4.00	\$ 0.50	\$ 0.00	\$ 0.00

As was the case with the put option, intrinsic value for the call option depends on whether or not your position can be exercised into a futures position and a profit taken given the current futures price. In the case of a call, however, the purchaser is now guaranteed a long position at the strike price. So the option holder of a call can make money by exercising into a long position at the strike price and offsetting that with a short when the futures price is above the strike price. For example, if the option holder had a call with an \$84 strike price and the futures price was \$85.00/cwt., the option could be exercised into a long position and immediately offset with a short, and the option holder would take \$1.00/cwt. profit out of the futures market. The intrinsic value of a **call** is the **futures price minus the strike price**. If the futures price is above the strike price the call option will have intrinsic value. If the futures price is equal to or below the strike price, then the option has zero intrinsic value. **The intrinsic value can never be negative.**

CALL	FUTURES PRICE	\$85.00	\$84.50	\$84.00	\$83.50
	<u>-STRIKE PRICE</u>	<u>\$84.00</u>	<u>\$84.00</u>	<u>\$84.00</u>	<u>\$84.00</u>
	INTRINSIC VALUE	\$ 1.00	\$ 0.50	\$ 0.00	\$ 0.00

If an option does not have intrinsic value, it does not mean that the premium for the option is zero. In fact, that premium can be fairly substantial even if the intrinsic value is zero. This is because two other factors affect the premium. If you were trying to insure your car and hadn't had an accident ever in your life, you would still have to pay a premium to an insurance company. The reason is because you can run the risk of still having an accident even if you haven't had one so far. Additionally, if you move to a large city such as Los Angeles, your insurance premiums may increase even if you've never had an accident. The insurance company assumes that you run a greater risk of getting into an accident there. As time passes by, it is likely that you will have an accident, and if you move to a place where there is more traffic you run a greater risk of being in an accident. These factors affect the risk that your insurance company will have to pay on a claim for your policy.

There are similarities between the premium for futures options and car insurance. The other two factors which affect premiums for options is time value and the volatility of the underlying futures market. The premium for the option represents what the buyer is willing and able to pay for the option in anticipation that, over time,

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a change in the futures price will cause the option to increase in value. It also represents the amount of risk the seller of the option is willing to take.

Generally, time value is the greatest at the beginning of the option contract because the risk that the futures price will move and cause the option to have intrinsic value is more likely. Just as you run the risk of having a car accident and the insurance company may have to pay a claim as time passes by, the option writer runs a higher risk of having to pay a claim on the option over time at the beginning of the option. The time value approaches zero as the option period draws to an end. As the option comes close to expiration it is less likely there will be a large move in futures prices which could cause the option to increase in value.

A major factor affecting the time value is **price volatility of the underlying futures contract**. If there are wide swings in the futures price, the chance for the option buyer to benefit increases while the risk to the seller increases. The seller wants additional protection. Just as is the case with auto insurance companies who want additional premiums when you move to Los Angeles because your chance for having an accident increases, the option writer runs a greater chance of paying off on the option if the futures price tends to be volatile for the underlying contract. Thus, the more volatile the underlying futures price, the higher the option premium.

Intrinsic value can also affect the time value of an option. Here are some terms describing the relationship of the strike price to the futures price.

	<u>PUT OPTION</u>	<u>CALL OPTION</u>
<b>In-the-money</b>	Strike Price > futures	Strike Price < futures
<b>At-the-money</b>	Strike Price = futures	Strike Price = futures
<b>Out-of-the-money</b>	Strike Price < futures	Strike Price > futures

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When the strike price equals the futures price, the option is **at-the-money**, and the intrinsic value is 0. However, time value is high **at-the-money** because the buyer has a high chance of prices moving to his benefit, and the seller has a high risk of prices moving against him. As the option moves **in-the-money**, its intrinsic value increases, while an **out-of-the-money** option has an intrinsic value of 0. In both of these cases, the time value decreases: The chance is less that the out-of-the-money option will end up in-the-money, and that the in-the-money option will end up **more** in-the-money.

When you look at the premium for an option, you can calculate the intrinsic value by comparing the strike price to the futures price. If the premium is more than the intrinsic value, the remaining amount is the time value.

$$\text{PREMIUM} = \text{INTRINSIC VALUE} + \text{TIME VALUE}$$

For a **put**, the strike price furthest **above** the futures price (in-the-money) will demand the highest premium. The strike price that is furthest **below** the futures price (out-of-the-money) will have the lowest premium. For a **call**, the strike price that is furthest **below** the futures price (in-the-money) will demand the highest premium. The strike price furthest **above** (out-of-the-money) will have the lowest premium.

You can see that the premium is based on the option's intrinsic value plus what the participants feel their opportunities and risks are. Knowing this can help you evaluate premiums at various strike prices and decide which option to purchase given your expectations for a target price. Because time value always decays to 0 when the option expires, you want to pay as little time value as possible.

## USING A PUT OPTION TO LOCK IN A MINIMUM SELLING PRICE

Remember the advantage to having a **put** option is that you can protect yourself against falling prices, but you are not locked into a price if prices rise. For that reason, when you have a commodity to **sell**, you can buy a **put option** to lock in a **minimum selling price** and take advantage of prices if they rise. As the option holder, you have three choices once you buy the put. If prices fall you can **exercise** the option into a futures position. In this case you would be subject to margin calls just as if you had entered the futures market in the first place, but we said one of the advantages using the options market was to avoid margin calls. Remember, that as futures falls below the strike price in the case of a **put** the intrinsic value of the put

# MARKETING AND RISK MANAGEMENT

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increases. Therefore, as time passes, if futures continue to fall, the option becomes worth more. Just as was the case in the futures market, you can **offset** your option position. This would be done by selling a like put at the same strike price. Given the premium should have increased in value as the option became more in the money, you can take a gain out of the options market by offsetting your put. If prices rise, then you are not locked into a position, the option becomes out-of-the-money. In this instance it is best to let the option **expire** worthless. It would make no sense to offset or exercise since you would lose money on the transaction. So to review, the put option holder can: 1) Offset: Sell put and get premium; 2) Exercise: Sell futures contract and buy back futures later; 3) Expire: Do nothing and lose premium.

Just as was the case for the futures market. The producer or holder of the commodity needs to decide whether the current options offer an acceptable forward pricing opportunity. In the case of the options market, however, it is important to remember that buying the put offers you a chance to lock in a minimum selling price. Therefore, the producer needs to estimate an acceptable minimum price and then calculate the **expected target price** using the various strike prices for the option of interest.

$$\text{PUT: EXPECTED TARGET PRICE} = \text{STRIKE PRICE} - \text{PREMIUM} + \text{BASIS}$$

Let's go through some examples illustrating how purchasing a put can insure a minimum selling price.

**Example 1.** Suppose you plan to have 130 steers coming off grass weighing an average of 800 pounds when you sell them in October. It's now May, and you are uncertain about the outlook for cattle prices. You are having trouble reading the market and aren't sure whether prices are headed up or down. A local buyer is offering a selling price of \$78/cwt, but your target price is higher. If prices go down, you want some protection with a locked-in minimum price for October delivery of the cattle. If prices go up, you'd like to be able to benefit. You decide to look at buying feeder cattle put options.

Your first step is to set an acceptable target price for the feeder cattle. Remember to calculate the expected target price for a put equals **strike price - premium + expected basis**.

There are October Feeder Cattle put options available at various strike prices, so you calculate a few target prices. You expect the basis in September to be \$2.00/cwt. under. The current October futures price is \$82.00/cwt.

Strike Price	\$86.00	\$84.00	\$82.00
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Premium Cost	- 4.50	- 2.75	- 0.75
Expected Basis	<u>+2.00</u>	<u>+2.00</u>	<u>+2.00</u>
Target Price	\$79.50	\$79.25	\$79.25

All three options offer you the chance to set a minimum price that is higher than what the local buyer is offering. In the case of the \$84 and \$82 puts both offer the same minimum price of \$79.25, but the \$82.00 put only costs you \$.75/cwt in premium. The \$84 put would cost \$2.75/cwt for the same minimum price. You choose the \$82 put. The total premium cost for the two options you need is \$750 (\$.75/cwt. \* 50,000lb./contract \* 2 contracts).

In September, futures prices have fallen to \$74, and the local cash price is \$72 when you sell the cattle the first of October. The basis is \$2.00 under, just as you expected. The October Feeder \$82 put now has a premium of \$8.00.

### TRANSACTIONS IN CASH AND OPTIONS MARKET

DATE	CASH MARKET	OPTIONS MARKET
MAY	Expect to sell 130 hd. in October	Buy 2 \$82 Oct. Feeder Puts @ \$0.75/cwt.
SEPTEMBER	Sell 130 head at Auction @ \$72.00	Sell 2 \$82 Oct. Feeder Puts @ \$8.00/cwt.

NET PRICE FOR CATTLE = CASH PRICE + OPTIONS GAIN

\$79.25	\$72.00	\$7.25 (\$8.00 - \$0.75)
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ACTUAL BASIS = CASH PRICE - FUTURES PRICE

-\$2.00	\$72.00	\$74.00
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Notice that the lower price in the cash market is offset by the gain you realized in the options market. Also notice that the minimum net price received is what we expected because the basis behaved as we expected.

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**Example 2.** What happens if the market rises rather than falls? Assume the same scenario, but suppose cash price in October turns out to be \$85.00/cwt, and the October futures price turns out to be \$87.00/cwt by the end of September. In this case we let the option expire worthless and capture some of the price rise in the cash market price.

## TRANSACTIONS IN CASH AND OPTIONS MARKET

DATE	CASH MARKET	OPTIONS MARKET
MAY	Expect to sell 130 hd. in October	Buy 2 \$82 Oct. Feeder Puts @ \$0.75/cwt.
SEPTEMBER	Sell 130 head at Auction @ \$85.00/cwt	Let put option expire

NET PRICE FOR CATTLE = CASH PRICE - OPTIONS LOSS

\$84.25                      \$85.00                      \$0.75

ACTUAL BASIS = CASH PRICE - FUTURES PRICE

-\$2.00                      \$85.00                      \$87.00

In this example we see the advantage of the put was not being locked into price. We were able to capture a rise in prices which would not have been possible if a straight hedge in the futures market had been used.

Also, we never had to exercise into the futures market in either example. Thus, we avoided having to put up with margin calls. In the case of options it is very rare that an option holder would ever want to exercise into the futures market. The option does not have to be exercised and a position in the futures acquired for the price protection to work. The option is simply sold as the end of the production or storage (in the case of grains) period approaches and the net from the offsetting (buy put - sell put) actions offsets any losses in the cash position.

## WHAT ABOUT BASIS?

Notice in both examples above the basis met our expectations. What would happen if basis did not meet our expectations? We said earlier that short hedgers would realize a gain if basis narrowed, and that long hedgers would realize a gain if basis widened. To a certain extent the same is true for people using the options market, but it differs somewhat because option holders are not locked in if prices move favorably. Let's go through both of the above examples, changing the basis relationships from our expectations.

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**Example 3.** In September, futures prices have fallen to \$74, and the local cash price is \$73.00 when you sell the cattle the first of October. The basis is \$1.00 under, i.e. it narrowed from your expectations. The October Feeder \$82 put now has a premium of \$8.00.

### TRANSACTIONS IN CASH AND OPTIONS MARKET

DATE	CASH MARKET	OPTIONS MARKET
MAY	Expect to sell 130 hd. in October	Buy 2 \$82 Oct. Feeder Puts @ \$0.75/cwt.
SEPTEMBER	Sell 130 head at Auction @ \$73.00	Sell 2 \$82 Oct. Feeder Puts @ \$8.00/cwt.

NET PRICE FOR CATTLE = CASH PRICE + OPTIONS GAIN  
                           \$80.25                           \$73.00                           \$7.25 (\$8.00 - \$0.75)

ACTUAL BASIS = CASH PRICE - FUTURES PRICE  
                           -\$1.00                           \$73.00                           \$74.00

Notice again that the lower price in the cash market is offset by the gain you realized in the options market. Also notice that the minimum net price received is higher than we expected because the basis narrowed from our expectations. If basis had widened from our expectations in this example our net price for the cattle would have been lower than our expected target price. Thus, in the case of put options the minimum selling price is subject to basis risk.

**Example 4.** What happens if the market rises rather than falls? Assume the same scenario, but suppose cash price in October turns out to be \$84.00/cwt, and the October futures price turns out to be \$87.00/cwt by the end of September. In this case we let the option expire worthless and capture some of the price rise in the cash market.

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## TRANSACTIONS IN CASH AND OPTIONS MARKET

DATE	CASH MARKET	OPTIONS MARKET
MAY	Expect to sell 130 hd. in October	Buy 2 \$82 Oct. Feeder Puts @ \$0.75/cwt.
SEPTEMBER	Sell 130 head at Auction @ \$84.00/cwt	Let put option expire

NET PRICE FOR CATTLE = CASH PRICE - OPTIONS LOSS

\$83.25	\$84.00	\$0.75
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ACTUAL BASIS = CASH PRICE - FUTURES PRICE

-\$3.00	\$84.00	\$87.00
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In this example we see again the advantage of the put was not being locked into price. We were able to capture a rise in prices which would not have been possible if a straight hedge in the futures market had been used. However, if this example is compared with the price received in example 2 our price is less. In this case basis widened from our expectations and the price received is lower than if basis had met our expectations.

## USING A CALL OPTION TO SET A MAXIMUM PURCHASE PRICE

A call option is used by someone who wants to protect against rising prices when purchasing inputs to be used to produce some other product. When you plan to **buy** a commodity, you can buy a **call option** to lock in a **maximum purchase price** and take advantage of prices if they fall. Remember the call option guarantees the holder the right to exercise into a long position in the futures market at the strike price. Just as in the case of the put option holder, three courses of action exist for the call option holder. If prices rise you can **exercise** the option into a futures position. In this case you would be subject to margin calls just as if you had entered the futures market in the first place, but we said one of the advantages using the options market was to avoid margin calls. Remember, that as futures rises above the strike price in the case of a **call** the intrinsic value increases. Therefore, as time passes, if futures continue to rise, the option becomes worth more. Just as was the case in the futures market, you can **offset** your option position. This would be done by selling a like call at the same strike price. Given the premium should have increased in value as the option became more in the money, you can take a gain out of the options market by offsetting your call. If prices fall, then you are not locked into a position, the option becomes out-of-the-money. In this instance it is best to let the option **expire**

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worthless. It would make no sense to offset or exercise as you would lose money on the transaction. So to review, the call option holder can: 1) Offset: Sell call and get premium; 2) Exercise: Buy futures contract and sell back futures later; 3) Expire: Do nothing and lose premium.

The purchaser of the commodity needs to decide whether the current options offer an acceptable forward pricing opportunity. In the case of the options market, however, it is important to remember that buying the call offers you a chance to lock in a maximum purchase price. Therefore, the producer needs to estimate an acceptable maximum price and then calculate the **expected target price** using the various strike prices for the option of interest.

$$\text{CALL: EXPECTED TARGET PRICE} = \text{STRIKE PRICE} + \text{PREMIUM} + \text{BASIS}$$

Let's go through some examples illustrating how purchasing a **call** can insure a maximum purchase price.

**Example 1.** Suppose it's October, and you're planning on buying corn for your cattle feeding operation in July. You figure you need to purchase 15,000 bushels. You can't afford to purchase the corn in a drought driven market. So you want to lock in a maximum purchase price now. Since options provide both protection and opportunity, you take a look at buying July calls for corn.

Your first step is to set an acceptable target price for the corn. Remember the expected target price for a call equals **strike price + premium + expected basis**.

There are July corn call options available at various strike prices, so you calculate a few target prices. You expect the basis in June to be \$.15/bu. under. The current July futures price is \$2.36/bu.

Strike Price	\$2.20	\$2.30	\$2.40
Premium Cost	+ .21	+ .12	+ 0.05
Expected Basis	<u>+ -.15</u>	<u>+ -.15</u>	<u>+ -.15</u>
Target Price	\$ 2.26	\$2.27	\$2.30

You decide to go with the July 240 corn call option because it offers you the most economical protection with a price that is close to a purchase price you're willing to accept as a maximum. The total premium cost for the three options you need is \$750 (\$0.05/bu \* 5000 bu/contract \* 3 contracts).

In June prices for corn have risen because of increased exports and lower than expected carryover stocks. When you purchase the corn at the local elevator you pay

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\$2.95/bu and the July futures price is \$3.16/bu. The call option moves into the money and has a premium of \$0.76/bu. when you sell it.

## TRANSACTIONS IN CASH AND OPTIONS MARKET

DATE	CASH MARKET	OPTIONS MARKET
OCTOBER	Expect to buy 15,000 bushels of corn.	Buy 3 240 July corn call options @ \$0.05/BU
JUNE	Purchase corn for \$2.95/bu.	Sell 3 240 July corn call options @ \$0.76/bu

NET PRICE FOR CATTLE = CASH PRICE - OPTIONS GAIN

\$2.24                                      \$2.95                                      \$0.71 (\$0.76-\$0.05)

ACTUAL BASIS = CASH PRICE - FUTURES PRICE

-\$0.21                                      \$2.95                                      \$3.16

In this example, the gain in the options market subsidized your purchase of the corn. Thus, the gain taken from the options market helped to offset the higher price you would have paid if you had just speculated in the cash market. Notice also that our actual purchase price was lower than what we had calculated as our expected maximum target price. That is because basis widened by \$0.06 from our expectations. The widening in the basis by \$0.06 translated into a purchase price of \$2.24/bu rather than \$2.30/bu.

**Example 2.** What happens if prices fall? Let's assume the same situation in the above example, except this time let's say prices fall. In June you are able to purchase the corn at the local elevator for \$1.80/bu and the futures price has fallen to \$1.85/bu. In this case the 240 call has no intrinsic value and you allow it to expire worthless.

## TRANSACTIONS IN CASH AND OPTIONS MARKET

DATE	CASH MARKET	OPTIONS MARKET
OCTOBER	Expect to buy 15,000 bushels of corn.	Buy 3 240 July corn call options @ \$0.05/bu
JUNE	Purchase corn for \$1.80/bu.	Let option expire worthless.

NET PRICE FOR CATTLE = CASH PRICE + OPTIONS LOSS

\$1.85                                      \$1.80                                      \$0.05

ACTUAL BASIS = CASH PRICE - FUTURES PRICE

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-\$0.05

\$1.80

\$1.85

In this example, you were able to capture the advantage of owning a call and not being locked in when prices fell to your advantage. Additionally, basis narrowed from our expectations by \$.10/bu. If it had not narrowed our from expectations our purchase price for the corn would have been \$1.75 rather than \$1.85. Again, this illustrates that people using the options are subject to basis risk.

## COSTS ASSOCIATED WITH USING OPTIONS

In the case of options three basic costs are associated with using this marketing tool which should be considered by the option buyer or holder. They are premium costs, brokerage commission and interest or opportunity costs.

As a buyer of a put option or a call option, the producer will pay a **premium** on the option up front. The seller of the option receives the premium. For example, a premium for a corn put option may be \$.20/bu, or a total of \$1,000 per option (\$.20/bu. \* 5000 bu/ option contract). A producer buying this corn put pays the premium of \$1,000 at the time of purchase; the seller's margin account receives the \$1,000.

The **buyer** of the corn put knows what his risk is. He has paid \$1,000 for protecting a minimum sales price. If the option is worthless at the time he is ready to sell his corn, he will let the option expire and lose the premium. If the value of the option is above 0, he can offset his position by selling back the put and perhaps earn a profit on the premium. The put buyer does not have to make a margin deposit or face margin calls while he holds the option.

The **seller** takes the greater risk. The seller can offset his position by buying back the put at any time before receiving an exercise notice, but it may not be to his benefit to offset at a particular time. Once an exercise notice is received, the seller must take a long position in the underlying futures contract. Also, the seller has to make a margin deposit when the put is sold and face margin calls to guarantee any loss he may incur.

A cost to option buyers is the **commission** charged by the broker. This cost is negotiable and depends on the level of service, quantity traded, and sometimes level of premium. There are many approaches used to charging commissions on options. Discount brokers specialize in executing trading orders for customers who do their own analysis of trading potential and do not desire assistance in analyzing pricing alternatives and price prospects. Full service brokers may provide assistance in these areas, in addition to executing trading orders. This cost should be considered when

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estimating your expected target price. For example, if a broker charges \$50 per round turn on each option contract, it would cost you \$0.01/bu. in commission fees for 5,000 bushel contracts.

One other expense in using options is interest on the premium money invested in options. If the producer in our example had not purchased options, he/she would have been able to pay down operation notes at the bank or to invest the money in C/Ds and earn interest on it. Thus, interest is an opportunity cost that should be included.

In the above example for the corn put the premium is \$1,000. Given an interest rate of 10% and the options position being held for ten months, the interest cost would be \$83.33 or almost \$0.02/bushel. This interest cost plus commission and option premium make up the cost associated with using options.

## OPTION FENCES

One of the disadvantages of using options is the premium cost. Another type of strategy which is more complex is called an **option fence**. The main reason some producers use this type of strategy is to reduce the premium cost associated with trading in options. In this strategy the producer who has a commodity to sell purchases a put to set a minimum price and sells or writes a call. Remember the seller of the call receives the premium, thus with this strategy price protection is obtained and premium outlay is reduced. In the case of a producer who wishes to purchase a commodity, a call is purchased and a put is sold. For our examples we will focus on the case of the producer who has a commodity to sell and wishes to protect against falling prices. This “fence” strategy is called that because a minimum and maximum price are set. Thus, a range of prices for the commodity are “fenced” in.

**Example 1.** Let's use an example to illustrate how this works. For purposes of this example let's use Sven Olsen. Let's say that Sven Olsen is a hog producer. In March Sven becomes nervous about the outlook for market hogs. His hogs will be ready in June. He decides that prices could go below \$50/cwt., but he thinks they won't go higher than \$58/cwt. The current futures price is \$53.00/cwt. Sven buys an out-of-the-money July live hogs put with a strike price of \$52 and he pays a premium of \$0.75/cwt. To finance the premium of the put he sells an out-of-the-money July live hogs call with a strike price of \$58/cwt. for \$1.55/cwt.

In this case let's assume the basis is \$1.00 over. Sven sells his hogs in the cash market for \$51/cwt., and the futures price is \$50/cwt. Prices did, in fact, fall. What is the price Sven got for his hogs not including transaction costs (i.e., brokerage fees and interest)?



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Sell hogs for:	\$51.00
Offset Put:	+ 2.00
Put premium	- 0.75
Call premium	<u>+ 1.55</u>
	\$53.80

**Example 2.** Assume the same situation as above, except in this case prices rise. When Sven markets his hogs the cash price is \$61.00/cwt and the futures price is \$60.00/cwt.

Sell hogs for:	\$61.00
Put Expires	+ 0.00
Put premium	- 0.75
Loss on Call	- 2.00
Call premium	<u>+ 1.55</u>
	\$59.80

## THINGS TO REMEMBER ABOUT USING AN OPTIONS FENCE STRATEGY

Selling the call puts the producer back in a position of being subject to margin calls. If the market moves above the call strike price, the producer is conceptually in the same position as if they had a short position in the futures market at the strike price. Thus, one of the advantages of options -- avoiding exposure to margin calls -- is eliminated.

If the futures market moves above the strike price of the call and stays there, the selling of the call will take away the benefits of using a put option to set a price floor and keep the upside potential open.

Selling the call may be viewed by the Internal Revenue Service as a speculative move rather than a legitimate hedge. If that is the case, any losses that are related to selling the call will not be viewed as deductible. In fact, taxes on option market activities of any kind are sketchy at this point in time. You should consult your accountant concerning the tax implications of using agricultural options.

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## COMPARISON OF PUTS VS FUTURES HEDGING OR CASH MARKET

In the trading examples we presented in this discussion, a put options position was advantageous when prices declined. However, when prices rose, it provided slightly lower return than the cash market because of the premium and trading costs. In the case of rising prices the options market is better than a straight futures hedge, but it is not as good as just being in the cash market. If prices fall, however, the options does provide a better price than just being in the cash price because a minimum price is set. A lower net price would be received from options though, rather than using a straight hedge in the futures market. In short, given perfect hindsight, the options market turns out to be the second best alternative in a market with rising or falling prices. But marketing decisions cannot be made from hindsight. If the producer's financial condition and cash-flow costs of production were such that he/she could not risk lower prices and there was some reasonable possibility that prices might rise, options could be the logical choice. A good marketing plan is very important.

## SUMMARY STATEMENTS ABOUT USING OPTIONS

There is no question that options add attractive dimensions and flexibilities for producers wanting to protect against price risk. Options eliminate margin call problems, and they don't eliminate taking advantage of favorable price moves (if fences are not used). However, a cost comes with these flexibilities and that is the premium.

Whether costs of an option-based marketing program exceeds costs of a futures-based program will depend on characteristics of underlying futures market. In a choppy and sideways market, the option approach will tend to be more costly. In a market with major sustained price trends, when significant margin calls can be involved, the futures-based program will typically be more costly on a per unit basis in terms of actual cost outlays and/or opportunity costs.

It is important to have a good marketing plan and to study the markets carefully. You will have to be a good student of the markets and try to better understand and anticipate direction of price trends. It is also imperative that you know your marketing costs so you can evaluate your marketing alternatives.

When trying to decide whether to use the futures or options here are some general guidelines.

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- Use options in markets likely to be characterized by large and sustained price moves.
- Use options when there will be problems in arranging for financing a margin line.
- Use options when the ability to manage a selective hedging program in the futures market is questionable.

Whether you use options or futures in your marketing program will vary across users depending on financial position, analytical skills, attitude toward risk, nature of price patterns in the futures market and management objectives of the firm.

## CHOOSING A BROKER

The most important aspect of choosing a broker is finding one that suits your needs. It depends on how much assistance you need in making your hedging decisions. There are basically two different kinds of brokers to choose between. There is the full-service broker and the discount broker.

If you want help in using market information to make hedging decisions, you may want to have a **full-service broker**. This type of broker will take the time to understand your situation, will be available for discussion and advice when you call to place an order, and may call you to make suggestions about future market actions. The brokerage firm may also send out market information, newsletters and have telephone hotlines to keep you informed. Commission fees are negotiable and vary from broker to broker. However, generally the more service the broker gives you, the higher the commission fees.

If you don't need advice to make your own hedging decisions, a **discount broker** may be right for you. In this case, you simply call in an order to the brokerage firm, and the order is placed for you. Commissions will be lower with a discount broker.

Here are a few tips on finding a good full-service broker.

- Talk to other producers and get referrals. Find out which brokers have satisfied customers and come highly recommended.
- Look for brokers who have an agricultural orientation.

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- Call or visit the brokers you are considering. You want a broker who takes the time to be interested in your operation and pays attention to your situation. It is extremely important that you trust your broker and feel that you can talk with him/her.

## OBTAINING HEDGING FUNDS

Hedgers rarely have enough capital to finance their own market activities. In the case of just using straight option strategies to set a minimum or maximum price, all that need be borrowed is the option premium. However, if an options fence is used, or if an options position is exercised into a futures position a credit line is needed that will adjust to changing margin account needs. Thus, it is usually necessary to set up a line of credit with a lender for your hedging activities. It is highly recommended that you finance your hedge with an operating loan specifically designed for hedging. The details of this loan should be spelled out in a three-party agreement between you, your lender and your broker. This agreement includes clauses such as:

- The lender agrees to supply funds for hedging only, not speculation;
- Hedging profits are applied against your loan balance;
- The lender will receive frequent reports on trading activity.

It is important that your lender understands the mechanics and fundamentals of hedging either with options or futures. If the lender gets nervous because of margin calls and forces you to lift your hedge too early it may mean unnecessary market losses for you.

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## GLOSSARY

**Basis** - The difference between cash and futures prices for a particular commodity. It is defined as cash price minus futures price for a specific location and for a specific point in time.

**Broker** - A person paid a commission for acting as an agent in buying and/or selling.

**Call option** - An option which gives the option buyer the right to purchase (go “long”) the underlying futures contract at the strike price on or before the expiration date.

**Derived demand** - Is used to specify demand schedules for resources that are used in producing final products.

**Elasticity of demand** - The responsiveness of the quantity taken of an item to a small change in its price, given the demand curve.

**Floor traders** - Brokers who trade in the futures or options pits on an exchange and fill orders for one or more brokerage firms and/or trades in their own account.

**Futures contract** - Contract for future delivery traded on organized futures exchanges and that specifies quality standards, delivery specifications, delivery locations, etc.

**Hedger** - Futures or options trader who has a position, or will have a position, in the cash market and wishes to transfer the risk of cash-market price fluctuations to someone else.

**Heterogeneous** - Units within a group have dissimilar characteristics.

**Homogeneous** - All units within a group are alike in their characteristics.

**Initial margin** - Margin required, per contract, before a potential trader can be involved in buying and selling futures contracts for a particular commodity.

**Long** - Refers to a “buy” position in the market-- to buy is to go “long.”

**Maintenance margin** - The level of margin funds that precipitates a margin call if the account balance falls below the specified maintenance level.

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**Margin call** - Monies that must be sent to the brokerage firm to maintain a futures market position when the market is moving against the trader's position.

**Market liquidity** - The presence of sufficient trade volume in a futures market to ensure an order can be quickly filled without large concession in price.

**Market power** - A firm's ability to influence product prices either on the buying or the selling side of the market.

**Offset** - Buying back after selling futures, or selling after buying futures, to cancel previously established futures positions.

**Option buyer (holder)** - The purchaser of an option, either a call option or a put option. The option buyer receives the right but not the obligation, to enter a futures market position.

**Option seller (writer)** - The seller of an option is subject to a potential obligation if the buyer chooses to exercise the option.

**Round turn commission** - Fee charged by a broker for the completion of a "sell and buy back" or a "buy and then sell" set of transactions.

**Put option** - An option which gives the option buyer the right to sell (go "short") the underlying futures contract at the strike price on or before the expiration date.

**Short** - Refers to a "sell" position in the market-- to sell is to "go short."

**Speculator** - Futures or options trader who has no position in the cash market and is attempting to earn profits as an investor in commodity futures or options.

**Underlying futures contract** - The specific futures contract which may be bought or sold if the option is exercised.